CLAIMS

What is claimed is:

1. A line card in a network element comprising:

a deframer unit to receive a Time Division Multiplexing (TDM) signal, the TDM signal including a payload and overhead data, the deframer to generate frame alignment data based on the overhead data;

a packet engine unit coupled to the deframer unit, the packet engine unit to receive the payload, the overhead data and the frame alignment data and to generate a number of packet engine packets, the packet engine packets representing a frame within the TDM signal such that the packet engine packets include the payload and the frame alignment data; and

a packet processor coupled to the deframer unit, the packet processor to receive the packet engine packets and to generate network packets based on the packet engine packets.

2. The line card of claim 1, wherein the packet engine packets include the payload, the overhead data and the frame alignment data.

3. The line card of claim 1, wherein the TDM signal includes a Digital Signal (DS)-1 signal.

4. The line card of claim 1, wherein the TDM signal includes a Digital Signal (DS) – 3 signal.

5. The line card of claim 1, wherein the TDM signal includes an E1 signal.

6. The line card of claim 5, wherein the packet processor compresses the DS0 signals.

7. The line card of claim 1, wherein the packet processor separates Digital Signal (DS) – 0 signals from within the TDM signal.

8. A network element comprising:

a number of line cards, each of the number of line cards including:

a deframer unit to receive a Time Division Multiplexing (TDM) signal, the TDM signal including a payload and overhead data, the deframer to generate frame alignment data based on the overhead data;

a packet engine unit coupled to the deframer unit, the packet engine unit to receive the payload, the overhead data and the frame alignment data and to generate a number of packet engine packets, the packet engine packets representing a frame within the TDM signal such that the packet engine packets includes the payload, the overhead data and the frame alignment data; and

a packet processor coupled to the deframer unit, the packet processor to receive the packet engine packets and to generate network packets based on the packet engine packets; and

at least one control card coupled to the number of line cards.

9. The network element of claim 8, wherein the TDM signal includes a Digital Signal (DS)-1 signal.

10. The network element of claim 8, wherein the TDM signal includes a Digital Signal (DS) – 3 signal.

11. The network element of claim 8, wherein the TDM signal includes a J1 signal.

12. The network element of claim 8, wherein the packet processor separates a number of Digital Signal (DS) – 0 signals from within the TDM signal.

13. The network element of claim 12, wherein the packet processor for each of the line cards forwards the number of DS0 signals out to any of the number of line cards based on forwarding tables, wherein any of the number of DS0 signals from any of the number of line cards can be combined to form a DS1 signal.

14. The network element of claim 13, wherein the DS1 signal is transmitted out from the line cards.

15. The network element of claim 12, wherein the packet processor compresses the DS0 signals.

16. A method comprising:

receiving a TDM signal that includes overhead data and payload data;

generating frame alignment data based on locations of frame boundaries within the TDM signal;

placing the TDM signal into packet engine packets based on the frame boundaries within the TDM signal, wherein the overhead data, the payload data and the frame alignment data are within packet engine packets, such that each packet engine packet corresponds to a frame within the TDM signal; and

encapsulating the packet engine packets into network packets.

17. The method of claim 16, wherein the TDM signal includes a Digital Signal (DS) – 1 superframe signal, such that each packet engine packet includes a DS1 frame of the DS1 superframe signal.

18. The method of claim 16, wherein the TDM signal includes a Digital Signal (DS) – 1 extended superframe signal, such that each packet engine packet includes a DS1 frame of the DS1 extended superframe signal.

19. The method of claim 16, wherein the TDM signal includes a Digital Signal (DS) – 3 signal, such that each packet engine packet includes a subframe of the DS3 signal.

20. The method of claim 16, wherein the network packets include Internet Protocol packets.

21. A method comprising:

receiving a first Time Division Multiplexing (TDM) signal that includes overhead data and payload data;

determining frame boundaries within the first TDM signal;

placing the first TDM signal into first packet engine packets based on the frame boundaries within the first TDM signal;

receiving a second TDM signal;

placing the second TDM signal into second packet engine packets, independent of frame boundaries within the second TDM signal; and

generating network packets from the first and second packet engine packets using a same packet processor.

22. The method of claim 21, wherein determining the frame boundaries with the first TDM signal includes generating frame alignment data for the first TDM signal.

23. The method of claim 22, wherein placing the first TDM signal into first packet engine packets includes placing the overhead data, the frame alignment data and the payload data into the first packet engine packets.

24. The method of claim 21, wherein the first and second TDM signals include a Digital Signal (DS) – 3 signal.

25. The method of claim 21, wherein the first and second TDM signals include a Digital Signal (DS) – 1 signal.

26. The method of claim 21, wherein the TDM signal includes an E3 signal.

27. A machine-readable medium that provides instructions, which when executed by a machine, cause said machine to perform operations comprising:

receiving a TDM signal that includes overhead data and payload data;

generating frame alignment data based on locations of frame boundaries within the TDM signal;

placing the TDM signal into packet engine packets based on the frame boundaries within the TDM signal, wherein the overhead data, the payload data and the frame alignment data into packet engine packets, such that packet engine packet corresponds to a frame within the TDM signal; and

encapsulating the packet engine packets into network packets.

28. The machine-readable medium of claim 27, wherein the TDM signal includes a Digital Signal (DS) – 1 superframe signal, such that each packet engine packet includes a DS1 frame of the DS1 superframe signal.

29. The machine-readable medium of claim 27, wherein the TDM signal includes a Digital Signal (DS) – 1 extended superframe signal, such that each packet engine packet includes a DS1 frame of the DS1 extended superframe signal.

30. The machine-readable medium of claim 27, wherein the TDM signal includes a Digital Signal (DS) – 3 signal, such that each packet engine packet includes a subframe of the DS3 signal.

31. The machine-readable medium of claim 27, wherein the TDM signal includes an E1 signal.

32. The machine-readable medium of claim 27, wherein the network packets include Internet Protocol packets.

33. A machine-readable medium that provides instructions, which when executed by a machine, cause said machine to perform operations comprising:

receiving a first Time Division Multiplexing (TDM) signal that includes overhead data and payload data;

determining frame boundaries within the first TDM signal;

placing the first TDM signal into first packet engine packets based on the frame boundaries within the first TDM signal;

receiving a second TDM signal;

placing the second TDM signal into second packet engine packets, independent of frame boundaries within the second TDM signal; and

generating network packets from the first and second packet engine packets using a same packet processor.

34. The machine-readable medium of claim 33, wherein determining the frame boundaries with the first TDM signal includes generating frame alignment data for the first TDM signal.

35. The machine-readable medium of claim 34, wherein placing the first TDM signal into first packet engine packets includes placing the overhead data, the frame alignment data and the payload data into the first packet engine packets.

36. The machine-readable medium of claim 33, wherein the first and second TDM signals include a Digital Signal (DS) – 3 signal.

37. The machine-readable medium of claim 33, wherein the first and second TDM signals include a Digital Signal (DS) – 1 signal.

38. The machine-readable medium of claim 33, wherein the TDM signal includes a J1 signal.